

SAFETY DATA SHEET



This Safety Data Sheet (SDS) complies with the requirements of the U.S. Federal Occupational Safety and Health Administration Hazard Communication Standard (29 CFR 1910.1200, as updated in 2012), the American National Standards Institute (Z400.1, 1998), and equivalent state Standards. It has also been developed in accordance with the Canadian Workplace Hazardous Materials Standard and the United Nations Globally Harmonized System of Classification of Chemicals, as well as European Union requirements under REACH (Registration, Evaluation, Authorization and Restriction of Chemical substances, per EC 1907/2006) and Directive 91/155/EC. Refer to Section 16 of this document for the definition of terms and abbreviations.

SECTION 1: IDENTIFICATION of the Substance/Mixture and of the Company/Undertaking

1.1 PRODUCT IDENTIFIER:

- PRODUCT NAME: **Rhodium Plating Solutions**
- SYNONYMS: Trade Names are listed below:
 - Pen Rhodium Concentrate (Pen Pals®)
 - Pen Rhodium Concentrate (0.5 grams, 1 gram, 1 ½ gram, 2 gram, 5 gram 10 gram, 20 gram)
 - Rhodium Replenisher Concentrate (0.5 gram, 1 gram, 2 gram, 5 gram, 10 gram)
 - Rhodium Plating Solution Concentrate (1 gram, 2 gram, 5 gram, 8 gram)
 - Rhodium Plating Solution (1/2 gram, 1 gram, 1 ½ gram, 1 ¾ gram, 2 gram, 4 gram, 5 gram, half pints, pints, quarts)
 - SUPERBRITE™
- CHEMICAL NAME/CLASS: Inorganic solution.

1.2 RELEVANT IDENTIFIED USES OF THE MIXTURE OR USES ADVISED AGAINST

- IDENTIFIED USE: Jewelry Plating
- USES ADVISED AGAINST: None Specified

1.3 DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET

- MANUFACTURER/
SUPPLIER: **COHLER ENTERPRISES, INC.**
- ADDRESS: 101 North Haven Street, Baltimore, MD 21224
- BUSINESS PHONE: 410-342-1400
- EMERGENCY PHONE: 1-800-424-9300 (CHEMTREC; 24 hours)
+1-703-527-3887 (CHEMTREC, International and Maritime)

1.4 OTHER PERTINENT INFORMATION

- This product is used as part of metal finishing and polishing processes in relatively small volume (less than 1 liter in size). This SDS has been developed to address safety concerns affecting small volume handling situations and those involving warehouses and other workplaces where large numbers of these items are stored or distributed.

SECTION 2: HAZARDS IDENTIFICATION

2.1 CLASSIFICATION OF THE SUBSTANCE OR MIXTURE:

REGULATION	CLASSIFICATION
OSHA HAZARD COMMUNICATION (GHS)	Skin corrosion (Category 1A); Serious eye damage (Category 1)
REACH/CLP (GHS)	Skin corrosion (Category 1A); Serious eye damage (Category 1) Acute aquatic toxicity (Category 3)
EU DIRECTIVES 67/548/EEC; 1999/45/EC	C [Corrosive]

SECTION 2: HAZARDS IDENTIFICATION (Continued)

3.1 LABEL ELEMENTS:

- OSHA/CLP – BASED ON GLOBALLY HARMONIZED SYSTEM

Symbol: To the right.

Signal Word: Danger.

Hazard statement(s)

- H314+H318: Causes severe skin burns and serious eye damage.
- H402: Harmful to aquatic life.

Precautionary statement(s)

- P102: Keep out of reach of children.
- P260: Do not breathe mist/ vapors/ spray.
- P264: Wash thoroughly after handling.
- P273: Avoid release to the environment.
- P280: Wear protective gloves/protective clothing/eye protection/face protection.
- P301 + P330+P331 IF SWALLOWED: Rinse mouth. Do not induce vomiting
- P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing.
- P310: Immediately call a POISON CENTER.
- P363: Wash contaminated clothing before reuse.
- P405: Store locked up.
- P501 Dispose of contents/ container to an approved waste disposal plant.



- EC DIRECTIVE SYMBOLS, RISK AND SAFETY PHRASES

Symbol: C [Corrosive]

Risk Phrases: [R: 35]: Causes severe burns.

Safety Phrases [S1/2] Keep locked up and out of the reach of children. [S: 26]: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. [S30] After contact with skin wash immediately with plenty of water and soap. [S29] Do not empty into drains. [S36/37] Wear suitable protective clothing and gloves. [S45] In case of accident or if you feel unwell, seek medical advice immediately and show container or label.



3.2 OTHER PERTINENT DATA ON CHEMICAL AND PHYSICAL HAZARDS:

- EMERGENCY OVERVIEW:

PHYSICAL DESCRIPTION: This is a clear, yellow-orange liquid.

HEALTH HAZARDS: The solution is corrosive, extremely irritating and damaging to contaminated skin, eyes, mucous membranes and other exposed tissues. Contact with this product can result in severe burns. Inhalation or ingestion of this product may be fatal.

FIRE HAZARDS: Although this solution is not flammable, Sulfuric Acid (a component of this product) can generate flammable hydrogen gas on contact with metals and can ignite combustible materials.

PHYSICAL HAZARDS: This product can generate significant amounts of heat when in contact with water.

ENVIRONMENTAL HAZARDS: This product is may be harmful or fatal to contaminated terrestrial and aquatic lifeforms.

SECTION 2: HAZARDS IDENTIFICATION (Continued)

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM

Health	3	<u>HMIS Personal Protective Equipment Rating:</u> Occupational Use situations: C; Safety glasses and gloves, and body protection suitable to specific circumstances of use. *2/1 Hazard Rating of 2 for solutions above 10% Sulfuric Acid
Flammability	0	
Physical Hazard	2/1*	
Protective Equipment	C	

CANADIAN REGULATORY STATUS

- This product is classified as hazardous under Canadian Controlled Products regulations (SOR-88-66). It is classified as D1-B: Materials Causing Immediate and Serious Toxic Effects; D2-B: Materials Causing Other Toxic Effects/Toxic Material; E: Corrosive Material; See symbol to right.
- This SDS contains all the information required by the CPR.



SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1/3.2 SUBSTANCES/MIXTURES

COMPONENT	CAS NUMBER	EINECS #	EC Class/Risk Phrases	% (w/w)
Rhodium Sulfate	10489-46-0	234-014-5	Not Established	0.5- 10
Sulfuric Acid	7664-93-9	231-639-5	Classification: C [R35] Causes severe burns	5-60
Water and other components. Each of the other components are present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens.)			Not Established	Balance

SECTION 4: FIRST AID MEASURES

4.1 DESCRIPTION OF FIRST AID MEASURES

Eyes: Flush with copious amounts of water for 15 minutes. "Roll" eyes during flush. Seek medical attention immediately. **Skin:** Flush area with warm, running water for 15 minutes. **Inhalation:** If vapors, mists, or sprays of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. **Ingestion:** Contact a Poison Control Center or physician for instructions. If professional advice is not available, do not induce vomiting. Victim should drink milk, egg whites, or large quantities of water. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or who cannot swallow.

4.2 MOST IMPORTANT ACUTE AND CHRONIC EXPOSURE SYMPTOMS

- **ACUTE:** Contact with this product can cause chemical burns and severe irritation of the contaminated tissues (skin, eyes, and mucous membranes). Inhalation of vapors or liquid may cause lung injury, the effects of which may not be apparent for up to 48 hours. This product may be fatal if inhaled or swallowed.
- **CHRONIC:** Prolonged or repeated inhalation over-exposures can cause burns and ulcers to the nose and throat, dental erosion, bronchitis, and stomach pain. Prolonged or repeated skin exposure can cause dermatitis.
- **TARGET ORGANS:** Eyes, skin, respiratory system.

4.3 INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED

- **RECOMMENDATIONS TO PHYSICIANS:** Treat symptoms and eliminate overexposure.
- **MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:** Respiratory problems and cardiovascular illnesses can be aggravated, as well as dermatitis and other skin disorders.

SECTION 5: FIREFIGHTING MEASURES

5.1 EXTINGUISHING MEDIA

- **RECOMMENDED FIRE EXTINGUISHING MEDIA:** Water Spray, Water Jet, Dry Powder, Foam, Carbon Dioxide, Halon, or any other.
- **UNSUITABLE FIRE EXTINGUISHING MEDIA:** None known.

5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE



NFPA RATING

NFPA FLAMMABILITY CLASSIFICATION: Not flammable.

UNUSUAL HAZARDS IN FIRE SITUATIONS: Though not flammable, when heated to decomposition, this product can emit acid mists and toxic gases (including oxides of sulfur and rhodium oxides). This product will generate significant amounts of heat when in contact with water. Contact with many inorganic and organic chemicals can cause potentially vigorous and violent reactions. Sulfuric Acid (a component of this product) is not flammable; in contact with metals, however, it will liberate hydrogen gas that may form an explosive mixture with air.

*2/1 = Rating of 2 for solutions above 10% Sulfuric Acid.

Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

5.3 ADVICE FOR FIREFIGHTERS

Wear Self Contained Breathing Apparatus and full protective equipment for fire response. Move containers from fire area if it can be done without risk to personnel. Otherwise, use water spray to keep fire-exposed containers cool. Contaminated equipment should be rinsed thoroughly with water before returning to service.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT, AND EMERGENCY PROCEDURES

- **RESPONSE TO INCIDENTAL RELEASES:** Personnel who have received basic chemical safety training can generally handle small-scale releases (e.g., under 1 gallon). For small releases, the minimum Personal Protective Equipment should be rubber gloves and rubber apron, splash goggles or safety glasses. In the event a release situation during which there is a potential for inhalation of mists or sprays, respiratory protection should be worn. If necessary, use air-purifying respirator with aid gas cartridges. Use caution during clean-up; contaminated floors and items may be slippery.
- **RESPONSE TO NON-INCIDENTAL RELEASES:** If oxygen levels are below 19.5% or are unknown, or if the release is deemed non-incident, clear the affected area, protect people, and respond with trained personnel. Minimum Personal Protective Equipment should be Level B: triple-gloves (rubber gloves and nitrile gloves, over latex gloves), chemically resistant suit and boots, hard-hat, and Self Contained Breathing Apparatus (SCBA). SCBA should be worn when oxygen levels are below 19.5% or are unknown. Neutralize residue with sodium bicarbonate or other neutralizing agent for acids. Ensure that the contaminated area is neutralized (pH 5-9) before releasing the area.
- **RESPONSE PROCEDURES FOR ANY RELEASE:** Absorb spilled liquid with polypads or other suitable absorbent materials. Neutralize residue or any potentially contaminated item with sodium bicarbonate or sodium bicarbonate solution. Use litmus paper to confirm contaminated items and areas are neutralized.

6.2 ENVIRONMENTAL PRECAUTIONS

- Avoid response actions that can cause a release of a significant amount of the substance (1 liter or more) into the environment.

SECTION 6: ACCIDENTAL RELEASE MEASURES (Continued)

6.3 METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP

- **SPILL RESPONSE EQUIPMENT:** Polypad or other absorbent material. Sodium bicarbonate, as needed, to neutralize area. Litmus paper for pH testing.

6.4 REFERENCES TO OTHER SECTIONS

- **SECTION 8:** For exposure levels and detailed personal protective equipment recommendations.
- **SECTION 13:** For waste handling guidelines.

SECTION 7: HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING

- **HYGIENE PRACTICES:** Keep out of reach of children. Follow good chemical hygiene practices. Do not smoke, drink, eat, or apply cosmetics in the chemical use area. Avoid inhalation of vapors, mists and sprays. Use in well-ventilated area. Avoid contact with skin or eyes. Remove contaminated clothing promptly. Clean up spilled product immediately.
- **HANDLING RECOMMENDATIONS:** Employees must be appropriately trained to use this product safely as needed. When diluting this solution, slowly add the product to the water, to prevent splattering. Keep containers closed when not in use.

7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

- **STORAGE RECOMMENDATIONS:** Ensure all containers are correctly labeled. Store containers away from direct sunlight, sources of intense heat, or where freezing is possible. Store this product away from incompatible chemicals (See Section 10, Stability and Reactivity). Empty containers may contain residual liquid; therefore, empty containers should be handled with care. Material should be stored in secondary containers, or in a diked area, as appropriate. Storage and use areas should be covered with impervious materials. Storage areas should be made of corrosion-resistant materials. If appropriate, post warning signs in storage and use areas. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged.

7.3 SPECIFIC END USES

- **RECOMMENDATIONS:** Place product away from children and animals.
- **INDUSTRIAL-SECTOR SPECIFIC SOLUTIONS: PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT --** Follow practices indicated in Section 6 (Accidental Release Measures).

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 CONTROL PARAMETERS

- **U.S. NATIONAL EXPOSURE LIMITS:**

COMPONENT	ACGIH TLV	OSHA PEL (ppm)	NIOSH REL (ppm)	OTHER
Rhodium Sulfate (Soluble rhodium compounds, as Rh)	TWA= 0.1 mg/m ³	TWA= 0.001 mg/m ³	TWA= 0.001 mg/m ³	NIOSH IDLH = 2 mg/m ³
Sulfuric Acid	TWA= 0.2 mg/m ³ [T, Thoracic fraction of the aerosol]	TWA= 1.0 mg/m ³	TWA= 1.0 mg/m ³	NIOSH IDLH = 15 mg/m ³

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION (Continued)

- INTERNATIONAL EXPOSURE LIMITS:**

COMPONENT	Federal Republic of Germany (DFG) Maximum Concentration Values in the Workplace (MAKs)	OTHER
Rhodium Sulfate	NE	NE
Sulfuric Acid	TWA= 0.1 mg/m ³ [I, Inhalable fraction of the aerosol]	United Kingdom Workplace Exposure limits: TWA = 0.05 mg/m ³ [Thoracic fraction of the mist]

- BIOLOGICAL OCCUPATIONAL EXPOSURE LIMITS:** Not established.
- DERIVED NO EFFECT LEVEL (DNEL):** Not established.
- PREDICTED NO EFFECT CONCENTRATION (PNEC):** Not established.

8.2 EXPOSURE CONTROLS

- ENGINEERING CONTROLS:** Use this product in well-ventilated environment. Safety showers, eye wash stations, and hand-washing equipment should be available.
- RESPIRATORY PROTECTION:** None needed under normal conditions of use. Use NIOSH approved respirators if ventilation is inadequate to control mists. Maintain airborne contaminant concentrations below guidelines listed in Section 3 (Composition and Information on Ingredients). If respiratory protection is needed, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, the European Standard EN149, or EC member states. The following NIOSH Respiratory Guideline Protection Equipment recommendations for Rhodium Compounds, soluble (a component of this product):
 - 0.010 mg/m³: Any air-purifying respirator with a high-efficiency particulate filter; supplied air respirator.
 - 0.025 mg/m³: Any supplied-air respirator in continuous-flow mode; any powered, air-purifying respirator with a high-efficiency particulate filter.
 - 0.050 mg/m³: HiEF/PAPRTHiE/SCBA/SAF; Any air-purifying, full-facepiece respirator with a high-efficiency particulate filter; any powered, air-purifying respirator with a high-efficiency particulate filter and a tight face-piece; full facepiece Self Contained Breathing Apparatus; or, Supplied Air Respirator.
 - 2.0 mg/m³: SAF:PD,PP Supplied Air Respirator operated in pressure demand or positive-pressure mode.
 - Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Positive pressure, full facepiece Self Contained Breathing Apparatus; or positive pressure, full facepiece Supplied Air Respirator with an auxiliary positive pressure Self Contained Breathing Apparatus.
 - Escape: Any air-purifying respirator with a high-efficiency particulate filter; or escape-type Self Contained Breathing Apparatus
- HAND PROTECTION:** Neoprene gloves should be used. Use triple gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this SDS. If necessary, refer to U.S. OSHA 29 CFR 1910.138, appropriate Standards of Canada, or appropriate Standards of the European Economic Community.
- EYE PROTECTION:** Splash goggles or safety glasses. If more than 1 gallon of this product is to be used, a face shield should be considered. If necessary, refer to U.S. OSHA 29 CFR 1910.133, Canadian Standards, or the European Standard EN166.
- BODY PROTECTION:** Use a body protection appropriate to task (e.g., lab coat, coveralls, or apron). Care should be taken to select protection for potentially exposed areas when splashes, sprays, or prolonged exposure could occur in occupational settings.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

- (a) **APPEARANCE:** Clear, Orange-yellow liquid.
(b) **ODOR:** Acrid.
(c) **ODOR THRESHOLD:** Not determined.
(d) **pH:** Less than 1.0.
(e) **MELTING POINT/FREEZING POINT:** Not available.
(f) **INITIAL BOILING POINT AND BOILING RANGE:** Not available.
(g) **FLASH POINT:** Not applicable.
(h) **EVAPORATION RATE (water=1):** Not available.
(i) **FLAMMABILITY:** Not flammable.
(j) **UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS:** Not applicable.
(k) **VAPOR PRESSURE (mmHg @ 20°C):** Not determined.
(l) **VAPOR DENSITY:** Not determined.
(m) **RELATIVE DENSITY (water=1):** 1-1.6
(n) **SOLUBILITY:** Soluble.
(o) **PARTITION COEFFICIENT: N-OCTANOL/WATER:** Not determined.
(p) **AUTO-IGNITION TEMPERATURE:** Not determined.
(q) **DECOMPOSITION TEMPERATURE:** Not determined.
(r) **VISCOSITY:** Not determined.
(s) **EXPLOSIVE PROPERTIES:** Not applicable.
(t) **OXIDIZING PROPERTIES:** Not an oxidizer.

9.2 OTHER INFORMATION

- **VOC (less water & exempt):** Not applicable.
- **WEIGHT% VOC:** Not applicable.

SECTION 10: STABILITY AND REACTIVITY

10.1 REACTIVITY

- Not reactive under typical conditions of use or handling; contact with water can generate significant amounts of heat.

10.2 CHEMICAL STABILITY

- Normally stable under standard temperatures and pressures.

10.3 POSSIBILITY OF HAZARDOUS REACTIONS

- This product is not self-reactive or air-reactive.
- This product can release heat upon contact with water.
- This product will not undergo hazardous polymerization.

10.4 CONDITIONS TO AVOID

- Avoid contact with incompatible chemicals.

10.5 INCOMPATIBLE MATERIALS

This product is not compatible with bases, halides, cyclopentadiene, cyclopentanone, oxime, nitroaryl amines, hexalithium disilicide, phosphorus(III) oxide, chlorine bromine pentafluoride, trifluoride, and oxygen difluoride (OF₂). Avoid contact with metals and water-reactive materials. This product can react with water to generate heat.

10.6 HAZARDOUS DECOMPOSITION PRODUCTS

- Products of thermal decomposition of this product can include oxides of sulfur and rhodium.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 INFORMATION ON TOXICOLOGICAL EFFECTS

- **ACUTE TOXICITY:**
 - **TOXICOLOGY DATA:** The following data are available for hazardous components in this product greater than 1% in concentration

SULFURIC ACID

Irritant (eye, rabbit) = 1.38 mg; severe effect
Irritant (eye, rabbit) = 100 mg with rinse, severe effect
TCLo (inhalation, rabbit) = 20 mg/m³
TCLo (inhalation, human) = 3 mg/m³/24 weeks
LDLo (unreported, man) = 135 mg/kg

SULFURIC ACID (continued)

LD50 (oral, rat) = 2140 mg/kg
LC50 (inhalation, rat) = 510 mg/m³/2 hr
LC50 (inhalation, mouse) = 320 mg/m³/2 hr
LC50 (inhalation, guinea pig) = 18 mg/m³

RHODIUM SULFATE

No data available.

SECTION 11: TOXICOLOGICAL INFORMATION (Continued)

- **DEGREE OF IRRITATION:** Moderate to severe especially after prolonged exposure.
- **SENSITIZATION:** Not reported to have skin or respiratory sensitization effects. Pure rhodium may have the potential to cause sensitization. Prolonged or repeated exposure to rhodium may lead to allergy-like symptoms (rashes, reddening of the skin).
- **REVIEW OF ACUTE SYMPTOMS AND EFFECTS:** See Section 2 (Hazards Information) and Section 4 (First-Aid Measures) for further details.
 - **EYES:** May cause moderate to severe eye irritation and chemical burns.
 - **SKIN:** May cause moderate to severe skin irritation, and chemical burns.
 - **INHALATION:** Mists or vapors of this product can cause nasal irritation, sore throat, choking, coughing, and breathing difficulties. Though unlikely to occur due to this product's small volume, it is important to note that inhalation of mists of this product (even for a few minutes) can cause severe lung damage with potentially life-threatening pulmonary edema (accumulation of fluid in the lungs). Symptoms of pulmonary edema include shortness of breath and chest pains; symptoms can be delayed for up to 48 hours after exposure. Prolonged or repeated over-exposures to this solution can cause burns and ulcers to the nose and throat, dental erosion, bronchitis and stomach pain.
 - **INGESTION:** Although not anticipated to be a significant route of occupational over-exposures, ingestion of this product may be fatal. Swallowing this material may cause burns in the mouth, throat, esophagus, and other tissue. Symptoms can include difficulty swallowing, intense thirst, nausea, vomiting, diarrhea, and in severe cases, collapse and death. Small amounts of acid can be aspirated during vomiting and may cause serious lung injury.

- **CHRONIC TOXICITY:**

- **CARCINOGENICITY STATUS:** The following table summarizes the carcinogenicity listing for the components of this product. "NO" indicates that the substance is not considered to be, or suspected to be, a carcinogen by the listed agency.

CHEMICAL	IARC	NTP	NIOSH	OSHA	OTHER
Rhodium Sulfate (Soluble rhodium compounds, as Rh)	NO	NO	NO	NO	MAK-3B: Substances of Concern Based on In Vitro Tests. TLV-A4: Not Classifiable as a Human Carcinogen.
Sulfuric Acid NOTE: The following information is pertinent to <i>Sulfuric in Inorganic Acid Mist</i> only!	Carc. to humans	Known to be Human Carc.	NO	NO	TLV-A2: Suspected Human Carcinogen. MAK-4: No Significant Contribution to Human Cancer Risk. California Prop. 65

- **REPRODUCTIVE TOXICITY INFORMATION:** The components of this product are not reported to cause reproductive effects under typical circumstances of exposure at the concentrations present in this product. Clinical studies on test animals exposed to relatively high doses of Sulfuric Acid (a component of this product) indicate teratogenic effects.
- **MUTAGENIC EFFECTS** The components of this product are not reported to cause mutagenic effects under typical circumstances of exposure.
- **SPECIFIC TARGET ORGAN TOXICITY – SINGLE EXPOSURE:** Not applicable.
- **SPECIFIC TARGET ORGAN TOXICITY – REPEATED EXPOSURE:** Not applicable.

- **OTHER INFORMATION**

- **TOXICOLOGICALLY SYNERGISTIC PRODUCTS:** None known.
- **ADDITIONAL TOXICOLOGY:** None known.

SECTION 12: ECOLOGICAL INFORMATION

12.1 TOXICITY

- Based on available data, this product is anticipated to be harmful or fatal to contaminated terrestrial plants or animals.
- Based on available data, this product is anticipated to be harmful or fatal to contaminated aquatic plants or animals. It has the potential to significantly lower the pH of the surrounding local water systems.
- There are following aquatic toxicity data are available for components of this product.

Sulfuric acid

LC50 *Gambusia affinis* (Mosquito fish) 42 mg/l 96 hours
Fish: Bluegill/Sunfish: 49 mg/L; 48Hr; TLm (tap water @ 20C)
Fish: Bluegill/Sunfish: 24.5 ppm; 48Hr; TLm (fresh water)

12.2 PERSISTENCE AND DEGRADABILITY

- When released into the soil, the components of this product are expected to biodegrade, dissipate in soils via oxidation, or otherwise chemically degrade or photo-decompose via solar radiation.

12.3 BIOACCUMULATIVE POTENTIAL

- The components of this product are not anticipated to bioaccumulate significantly.

12.4 MOBILITY IN SOIL

- It is to be expected this product will have small mobility in soil. Some of the components may get into the soil and, ultimately, the ground water. Product spreads on the water surface.

12.5 RESULTS OF PBT and vPvB ASSESSMENT

- No data are available.

12.6 OTHER ADVERSE EFFECTS

- ENDROCRINE DISRUPTOR INFORMATION: No component is reported to be an endocrine disruptor.

SECTION 13: DISPOSAL CONSIDERATION

13.1 WASTE TREATMENT METHODS

- WASTE HANDLING RECOMMENDATIONS:** Prepare, transport, treat, store, and dispose of waste product according to all applicable local, U.S. State and U.S. Federal regulations, the applicable Canadian standards, or the appropriate standards of the nations of the European Community.
- PRECIOUS METAL RECLAMATION:** Users of the product may wish to utilize precious metal reclamation services for final disposition of wastes.

13.2 DISPOSAL CONSIDERATIONS

- EPA RCRA WASTE CODE:** D002 **EUROPEAN WASTE CODE:** 11 01 06*

SECTION 14: TRANSPORT INFORMATION

14.1,2,3,4: DANGEROUS GOODS BASIC DESCRIPTION AND OTHER TRANSPORT INFORMATION

- DEPARTMENT OF TRANSPORTATION HAZARDOUS MATERIALS SHIPPING REGULATIONS:**

UN/NA Number	Proper Shipping Name	Packing Group	Hazard Class	Label	North American Emergency Response Guide #	Marine Pollutant Status
UN3264	Corrosive liquids, acidic, inorganic, n.o.s. (Sulfuric Acid, Rhodium Sulfate)	II	8	See Other Relevant Information	154	Not Applicable

SECTION 14: TRANSPORT INFORMATION (Continued)

○ **OTHER RELEVANT INFORMATION:**

Small Quantity Exception (49 CFR 173.4, 4a): Small quantities of Class 8 materials are not subjected to other requirements of the Hazardous Materials Regulations (Subchapter C) when the maximum quantity per inner receptacle is limited to 30 mL (liquids). Refer to 49 CFR 173.4 for specific information in packaging small quantity materials.

Limited Quantity Exceptions [49 CFR 173.154(b)(2)]: Limited quantities for Class 8, Packing Group II materials have inner packagings not over 1.0 L [0.3 gal] (liquids) net capacity each, packed in strong outer packaging.

- **CANADIAN TRANSPORTATION INFORMATION:** This product is regulated by Transport Canada as dangerous goods under Canadian transportation standards. Refer to above information.
- **IATA DESIGNATION:** This product is regulated as dangerous goods by the International Air Transport Association. Use the following information:

Proper Shipping Name	Passenger and Cargo Aircraft				Cargo Aircraft Only	
	Limited Quantity		Packing Instruction	Max. Qty per PKG	Packing Instruction	Max. Qty per PKG
	Packing Instruction	Max. Qty per PKG				
Corrosive liquid, acidic, inorganic, n.o.s. (sulfuric acid, rhodium sulfate)	Y840	0.5L	851	1L	855	30L

- **EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR):** This product is to be dangerous goods. Use the above information for transport classification.

14.5: ENVIRONMENTAL HAZARDS

- None described, as related to transportation.

14.6: SPECIAL PRECAUTIONS FOR USERS

- Not applicable.

14.7: TRANSPORT IN BULK

- Not applicable.

SECTION 15: REGULATORY INFORMATION

15.1: SAFETY, HEALTH, AND ENVIRONMENTAL REGULATIONS SPECIFIC FOR THE SUBSTANCE OR MIXTURE.

● **OTHER IMPORTANT U.S. REGULATIONS**

- **U.S. SARA THRESHOLD PLANNING QUANTITY:** Sulfuric Acid = 454kg (1000 lb)
- **U.S. SARA HAZARD CATEGORIES (SECTION 311/312, 40 CFR 370-21):** ACUTE: Yes; CHRONIC: Yes; FIRE: No; REACTIVE: No; SUDDEN RELEASE: No
- **U.S. CERCLA REPORTABLE QUANTITY (RQ):** Sulfuric Acid = 454kg (1000 lb).
- **U.S. TSCA INVENTORY STATUS:** All components of this product are listed on the TSCA Inventory.
- **US SARA 313:** Sulfuric acid (aerosol forms only) is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.
- **CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) STATUS:** Not applicable to the product; only "Inorganic Mist containing Sulfuric Acid" is listed as known to the State of California to cause cancer.

● **INTERNATIONAL REGULATIONS**

- **CANADIAN DSL/NDSL INVENTORY STATUS:** The listed components of this product are on the DSL/NDSL Inventory.
- **CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS:** The components of this product are not on the CEPA Priorities Substances Lists.
- **GERMAN WATER HAZARD CLASSIFICATION:** 2 (hazard to waters)

15.2: CHEMICAL SAFETY ASSESSMENT.

- No information available.

SECTION 16: OTHER INFORMATION

16.1: INDICATION OF CHANGE.

- **CHANGE INDICATED:** Amended DOT Information.
- **ORIGINAL DATE OF ISSUE:** Feb. 14, 2002
- **DATES OF UPDATES:** May 2005; Mar. 28, 2013; April 17, 2014; July 15, 2014; June 8, 2016

16.2: ABBREVIATIONS AND ACRONYMS.

ALL SECTIONS: OSHA: U.S. Federal Occupational Safety and Health Administration. WHMIS: Canadian Workplace Hazardous Materials Standard. GHS: Globally Harmonized System of Classification of Chemical Substances. REACH: European Union regulation, Registration, Evaluation, Authorization and Restriction of Chemical substances.

SECTION 2: CAS Number: Chemical Abstract Service Number, which is used by the American chemical Society to uniquely identify a chemical. EINECS: European Inventory of Existing Commercial Substances.

SECTION 3: HAZARDOUS MATERIALS IDENTIFICATION SYSTEM RATING: This is a rating system used by industry to summarize physical and health hazards to chemical users and was originally developed by the National Paint and Coating Association. 0 = No Significant Hazard. 1 = Slight Hazard. 2 = Moderate Hazard. 3 = Severe Hazard. 4 = Extreme Hazard.

SECTION 5: NFPA: National Fire Protection Association. NFPA FLAMMABILITY CLASSIFICATION: The NFPA uses the flash point (F.L.P.) and boiling point (BP) to classify flammable or combustible liquids. Class IA: F.L.P. below 73°F and BP below 100°F. Class IB: F.L.P. below 73°F and BP at or above 100°F. Class IC: F.L.P. at or above 73°F and BP at or above 100°F. Class II: F.L.P. at or above 100°F and below 140°F. Class IIIA: F.L.P. at or above 140°F and below 200°F. Class IIIB: F.L.P. at or above 200°F. NFPA HAZARDOUS MATERIALS RATING: This is a rating system used to summarize physical and health hazards to firefighters. 0 = No Significant Hazard. 1 = Slight Hazard. 2 = Moderate Hazard. 3 = Severe Hazard. 4 = Extreme Hazard.

SECTION 8: NE: Not established. ACGIH: American Conference of Government Industrial Hygienists; TWA: Time-Weighted Average (over an 8-hour work day); STEL: Short-Term Exposure Limit (15 minute average, no more than 4-times daily and each exposure separated by one-hour minimally); C: Ceiling Limit (concentration not to be exceeded in a work environment). PEL: Permissible Exposure Limit. NIOSH: National Institute of Occupational Safety and Health; REL: Recommended Exposure Limit; IDLH: Immediately Dangerous to Life and Health Concentrations. *Note:* In July 1992, a court ruling vacated the more protective PELs set by OSHA in 1989. Because OSHA may enforce the more protective levels under the "general duty clause", both the current and vacated levels are presented in this document. ppm: Parts per Million. mg/m³: Milligrams per cubic meter. mppcf: Millions of Particles per Cubic Foot. BEI: Biological Exposure Limit. EL: Exposure Limit (United Kingdom). Federal Republic of Germany (DFG) Maximum Concentration Values in the Workplace (MAKs)

SECTION 9: pH: Scale (0 to 14) used to rate the acidity or alkalinity of aqueous solutions. For example, a pH value of 0 indicates a strongly acidic solution, pH of 7 indicates a neutral solution, and a pH value of 14 indicates an extremely basic solution. FLASH POINT: Temperature at which a liquid generates enough flammable vapors so that ignition may occur. AUTOIGNITION TEMPERATURE: Temperature at which spontaneous ignition occurs. LOWER EXPLOSIVE LIMIT (LEL): The minimal concentration of flammable vapors in air which will sustain ignition. UPPER EXPLOSIVE LIMIT (UEL): The maximum concentration of flammable vapors in air which will sustain ignition. ≈: Approximately symbol.

SECTION 11: CARCINOGENICITY STATUS: NTP: National Toxicology Program. IARC: International Agency for Research on Cancer. REPRODUCTIVE TOXICITY INFORMATION: Mutagen: Substance capable of causing chromosomal damage to cells. Embryotoxin: Substance capable of damaging the developing embryo in an overexposed female. Teratogen: Substance capable of damaging the developing fetus in an overexposed female. Reproductive toxin: Substance capable of adversely affecting male or female reproductive organs or functions. TOXICOLOGY DATA: LD_{xx} or LC_{xx}: The Lethal Dose or Lethal Concentration of a substance which will be fatal to a given percentage (xx) of exposed test animals by the designate route of administration. This value is used to access the toxicity of chemical substances to humans. TD_{xx} or TC_{xx}: The Toxic Dose or Toxic Concentration of a substance which will cause an adverse effect to a given percentage (xx) of exposed test animals by the designate route of administration.

SECTION 12: TL_m – Median Tolerance Limit

SECTION 13: RCRA: Resource Conservation and Recovery Act. The regulations promulgated under this act under Act are found in 40 CFR, Sections 260 ff, and define the requirements of hazardous waste generation, transport, treatment, storage, and disposal. EPA RCRA Waste Codes: Defined in 40 CFR Section 261.

SECTION 15: CERCLA: Comprehensive Environmental Response Compensation and Liability Act (a.k.a. "Superfund") and SARA: (Superfund Amendment and Reauthorization Act). The regulations promulgated under this Act are located under 40 CFR 300 ff. and provide "community right-to-know" requirements. DSL/NDL: Canadian Domestic Substances and Non-Domestic Substances Lists.

16.3: KEY LITERATURE REFERENCES AND SOURCES FOR DATA

- SAFETY DATA SHEETS FOR COMPONENT PRODUCTS.
- Regulations (EC) No 1907/2006, 1272/2008 & 453/2010 of the European Parliament and of the Council.
- Federal OSHA Hazard Communication Standard: 29 CFR 1910.1200
- SAX – Dangerous Properties of Industrial Materials
- RTECS – Registry of Effects of Toxic Chemicals
- ESIS -European chemical Substances Information System <http://esis.jrc.ec.europa.eu/>

16.4: CLASSIFICATION AND PROCEDURE USED TO DERIVE THE CLASSIFICATIONS FOR MIXTURES

- CLASSIFICATION: Section 2 (Hazards Information) provides all relevant classification information used for this product. The assignments were based on data available for the component products, calculations, expert judgment, and weight of evidence.

16.5: WARRANTY AND COPYRIGHT

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